

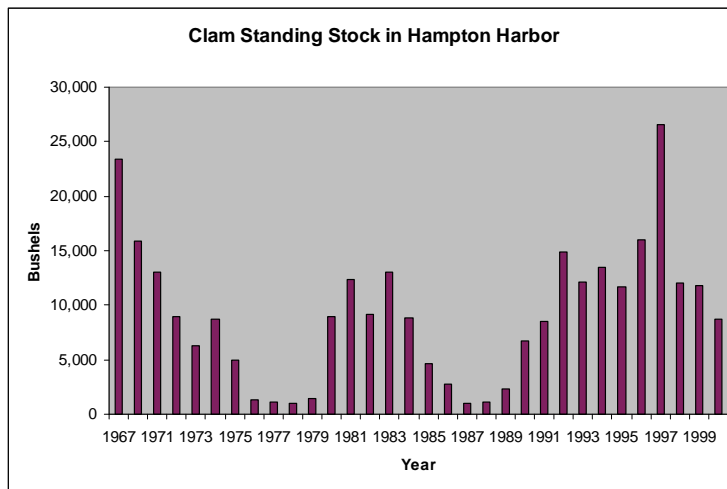
Juvenile Clam Field Experiments in Hampton Harbor Provide Insight into a Roller Coaster Population

By Dave Kellam, Project Assistant, New Hampshire Estuaries Project

Hampton Harbor in New Hampshire is located about 45 miles northeast of Boston and is known as the State's best bet for harvesting soft-shell clams; at least during some years. In the past 30 years the Hampton Harbor flats have experienced dramatic peaks and valleys in its clam populations ranging from a high of 27,000 bushels in 1997 to lows less than 1,000 bushels in 1978 and 1987 (see chart). Overharvesting was suspected as the cause of these fishery crashes; however, recent examinations suggest that there may be more to the story.

In 2001 the New Hampshire Estuaries Project issued a Request for Proposals (RFP) to "determine the cause(s) of juvenile soft-shell clam mortality in the Hampton/Seabrook Estuary". The focus of the RFP was on juvenile clam mortality because previous surveys suggested that clam larvae were settling in the harbor's substrate but juvenile clams were not being recruited to the adult class. Researchers, clammers, and managers had compiled a list of possible causes for the juvenile clam mortality that included disease, human disturbance, winterkill, pollution, competition with other bivalves, and/or predation from wildlife. These factors were written into the RFP to ensure that they were addressed by the research.

University of Maine at Machias researcher Dr. Brian Beal was awarded the contract for the RFP and he conducted his field research at three clam flats in Hampton Harbor from November 2001 to July 2002. To understand what was happening to juvenile clams, Dr. Beal employed a series of manipulative field experiments. He placed hatchery-reared, juvenile clams into six-inch plastic plant pots that were filled with sediments from each flat and buried to their rims. Half the pots were stocked with a high density of clams to determine whether crowding affected survival. To assess the effects of predation Dr. Beal placed flexible plastic netting over some of the pots to exclude predators. He collared other pots with netting that extended about 1 inch above the rim to contain clams dislodged by sediment erosion. In total Dr. Beal's research team placed 360 pots in the harbor from November through March and another 360 pots for the period from March to mid-July. The carefully crafted design also addressed potential differences in clam growth and survival with respect to tidal height. In addition to these field experiments wild and experimental clams were tested for hematopoietic neoplasia, a common clam disease.



The results of Dr. Beal's work suggested that sediment erosion by tidal and wind currents and predation by crustaceans, primarily green crabs, were significant factors that increased juvenile clam mortality. Strong currents dislodged many of the experimental units and the unprotected clams simply were washed away. Predation by the non-native green crab (*Carcinus maenas* L.), a notorious juvenile clam predator, was observed in unprotected pots and pots with torn protective screening.

Dr. Beal's study is not the final step in understanding Hampton Harbor's clam stocks. More work needs to be done to quantify the affects of recreational clam harvesting, clam stocking, competition with other bivalves and other factors that will become apparent as work progresses. What Dr. Beal's study does represent is the first *experimental* study in Hampton Harbor that tests specific hypotheses about local clam populations to offer resource managers quantitative data that may inform management decisions.